low carbon soybean

Heightening the value of the sustainable soybean production system

Embrapa

The Brazilian agribusiness production chains have been creating mechanisms to collaborate with the global goal of reducing greenhouse gas emissions (GHG). Since 2021, Embrapa Soja has been conducting an initiative to promote GHG emissions mitigation, carbon sequestration and storage in the soybean production processes. The Low Carbon Soybean Program adopts a sectorial innovation model in partnership with seven supporting companies: Bayer, Bunge, Cargill, Coamo, Cocamar, GDM, and UPL.

The Program seeks to develop metrics based on objectively measurable, reportable, and verifiable criteria to attest to the sustainability of Brazilian soybean production, making qualitative and quantitative aspects of the production system tangible. The Brazilian methodology will measure the benefits and certify soybean production practices that reduce the intensity of GHG. Adherence to the Low Carbon Soybean seal will be voluntary, with the protocol applied through private certification from specialized companies (3rd party certification).

Initiative: Embrapa

Supporting companies: Bayer, Bunge, Cargill, Coamo, Cocamar, GDM, UPL

Good Agricultural Practices: the basis of sustainable agriculture

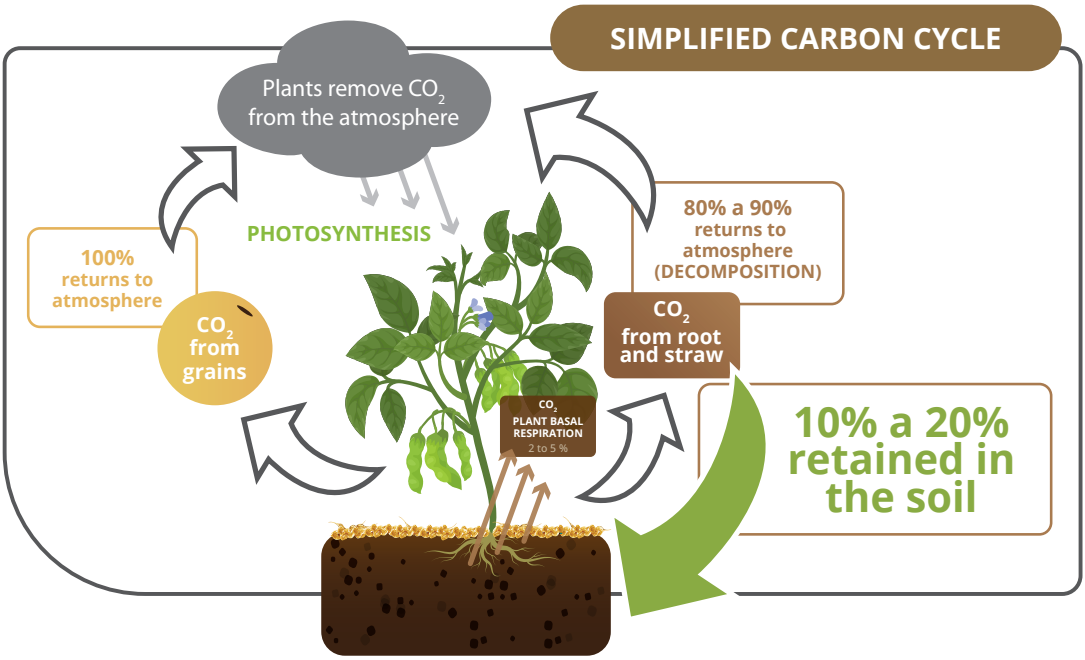
The Low Carbon Soybean Program estimates that the potential for reducing GHG in soybean cultivation can be approximately 30% by adopting the sustainable technologies recommended by research. It is worth mentioning that agricultural practices that reduce GHG are the same ones that increase productivity and diminish costs, therefore bringing gains to the production system.

A few examples of good agricultural practices are no-tillage system (NTS), biological nitrogen fixation, crop-livestock-forest intercropping, fertilization and soil correction, and integrated management of pests, diseases, and weeds.

Benefits
No-tillage system

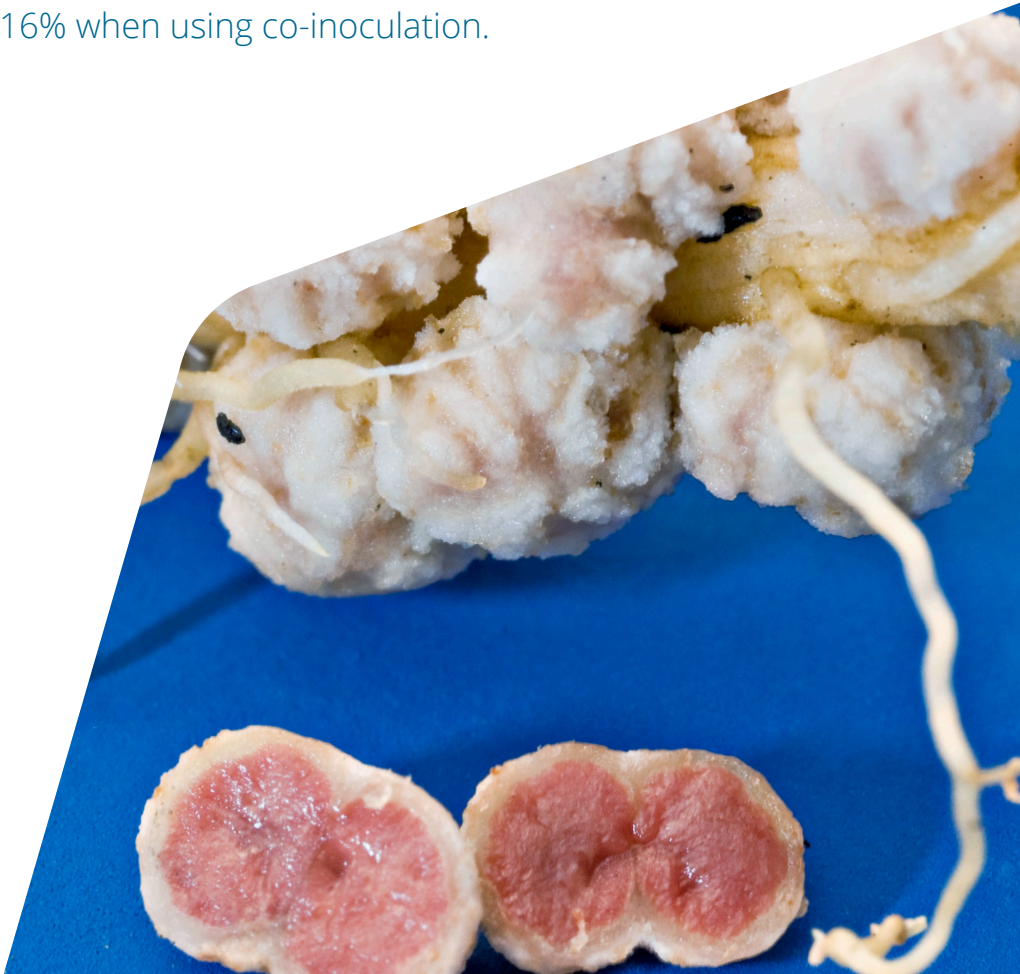
Studies carried out by Embrapa prove the benefits of using good agricultural practices. Converting conventional tillage to a no-tillage system accumulated 60 tons of immobilized CO_2 equivalent per hectare during 20 years, corresponding to 3 tons of immobilized CO_2 equivalent per year.

In addition to being removed from the atmosphere and contributing to climate change mitigation, this carbon also brings numerous benefits to the soil and crops in the form of organic matter. For effectiveness, the no-tillage system must have the support of its basic premises: minimum soil disturbance and crop rotation and diversification.



Biological Nitrogen Fixation

The elimination of chemical nitrogen fertilizer in soybean crops and the appropriate use of inoculants are opportunities to decrease CO_2 equivalent emissions, increase productivity, and reduce production costs. In addition to reducing the use of petroleum-derived fertilizers and nitrous oxide emissions, which are highly harmful to the climate, it also can increase soybean productivity by approximately 16% when using co-inoculation.



Integrated
Crop-Livestock-Forestry systems

Farmers can benefit by adopting the integrated crop-livestock-forest production system as it increases diversification. The arboreal component can sequester more CO_2 from the atmosphere and provide extra income.

Fertilization and soil correction

Fertilization management is decisive for mitigating GGE due to its impact on the organic carbon content of the soil. Therefore, adopting good fertilization practices becomes relevant to improving the greenhouse gas balance in soybean production systems.

Integrated management of **Pests, Diseases, and Weeds**

Monitoring crops is crucial to apply chemicals only when necessary. That brings benefits from a financial point of view, reducing applications, machine traffic, and, consequently, the burning of fossil fuels, which reduces emissions.

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Supporting companies:

BAYER · BUNGE · Cargill · coamo · cocamar · GDM · UPL OpenAg

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